REMARKS

Claim 24 is canceled without prejudice or disclaimer. It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

I. The Rejection of Claim 24 under 35 U.S.C. 112

Claim 24 is rejected under 35 U.S.C. 112. Applicants previously intended to cancel claim 24, but failed to make the appropriate amendment. Claim 24 is now canceled to render this rejection moot.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 112. Applicants respectfully request reconsideration and withdrawal of the rejection.

II. The Rejection of Claims 1-24 under 35 U.S.C. 103

Claims 1-24 are rejected under 35 U.S.C. 103(a) as obvious over Maselli et al. The Examiner indicates in the Advisory Action that Applicants arguments that alpha-amylase, maltogenic alpha-amylase and pullulanase are different classes of enzyme with different action patterns and different end products are not found to be persuasive because:

> Maltogenic alpha-amylase is a species within the alpha-amylase enzyme; it can generate maltose; however, regular alpha-amylase can also generate maltose. Thus, there is not much difference in function between the two enzymes.

As discussed in Applicants prior response, a "maltogenic alpha-amylase" is a different enzyme from an "alpha-amylase." There are many differences in function between the two enzymes and the two enzymes are recognized in the art as different enzymes. In this regard, a "maltogenic alpha-amylase" is also not a species of an "alpha-amylase."

A maltogenic alpha-amylase and an alpha-amylase are classified under two separate enzyme classifications. A "maltogenic alpha-amylase" is classified under E.C. 3.2.1.133, whereas an "alpha-amylase" is classified under E.C.3.2.1.1. Attached herewith as Exhibits A and B are the descriptions for these two separate classifications taken from the International Union of Biochemistry and Molecular Biology (http://www.chem.qmul.ac.uk/iubmb/). As illustrated in these documents, a "maltogenic alpha-amylase" reaction is different from the reaction of an "alpha-amylase." An "alpha-amylase" is known in the art to be 1,4-α-D-glucan glucanohydrolase EC 3.2.1.1, whereas a "maltogenic alpha-amylase" is known in the art to be 1,4-α-D-glucan α-

maltohydrolase EC 3.2.1.133. In sum, a "maltogenic alpha-amylase" is not an "alpha-amylases," and it is not a species of an alpha-amylase. Thus, the maltogenic amylases used in the present invention are recognized in the literature as different enzymes with different reaction products from alpha-amylases.

Accordingly, as a maltogenic alpha-amylase is recognized in the art as a different enzyme form an alpha-amylase, one of ordinary skill in the art would not have been motivated, with any reasonable expectation of success, to have substituted a "maltogenic alpha-amylase" for an "alpha-amylase" of Maselli et al., which is a different enzyme.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

III. Conclusion

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

Date: April 12, 2006

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IUBMB Enzyme Nomenclature

EC 3.2.1.133

Common name: glucan 1,4-α-maltohydrolase

Reaction: hydrolysis of (1→4)-α-D-glucosidic linkages in polysaccharides so as to remove successive α-maltose residues from the non-reducing ends of the chains

Other name(s): maltogenic α-amylase

Systematic name: 1,4-α-D-glucan α-maltohydrolase

Comments: Acts on starch and related polysaccharides and oligosaccharides. The product is α-maltose; *cf.* EC 3.2.1.2 β-amylase.

Links to other databases: BRENDA, EXPASY, KEGG, ERGO, PDB, CAS registry number: 160611-47-2

References:

1. Diderichsen, B. and Christiansen, L. Cloning of a maltogenic alpha-amylase from *Bacillus stearothermophilus*. *FEMS Microbiol. Lett.* 56 (1988) 53-59.

2. Outtrup, H. and Norman, B.E. Properties and application of a thermostable maltogenic amylase produced by a strain of *Bacillus* modified by recombinant-DNA techniques. *Stärke* 36 (1984) 405-411.

[EC 3.2.1.133 created 1992, modified 1999]

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IUBMB Enzyme Nomenclature

EC 3.2.1.1

Common name: α-amylase

Reaction: Endohydrolysis of 1,4-α-D-glucosidic linkages in polysaccharides containing three or more 1,4-α-linked D-glucose units

Other name(s): glycogenase; α amylase, alpha-amylase; endoamylase; Taka-amylase A

Systematic name: 1,4-α-D-glucan glucanohydrolase

Comments: Acts on starch, glycogen and related polysaccharides and oligosaccharides in a random manner; reducing groups are liberated in the α-configuration. The term 'α' relates to the initial anomeric configuration of the free sugar group released and not to the configuration of the linkage hydrolysed.

Links to other databases: BRENDA, EXPASY, GTD, KEGG, ERGO, PDB, CAS registry number: 9000-90-2

References:

1. Fischer, E.H. and Stein, E.A. α-Amylases, in Boyer, P.D., Lardy, H. and Myrbäck, K. (Eds.), *The Enzymes*, 2nd edn., vol. 4, Academic Press, New York, 1960, pp. 313-343.

2. Manners, D.J. Enzymic synthesis and degradation of starch and glycogen. *Adv. Carbohydr. Chem.* 17 (1962) 371-430.

3. Schwimmer, S. and Balls, A.K. Isolation and properties of crystalline α-amylase from germinated barley. *J. Biol. Chem.* 179 (1949) 1063-1074.

[EC 3.2.1.1 created 1961]

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